

DOCKET NO.: 259593US40PCT/mda

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

IN RE APPLICATION OF:

GROUP: 1797

Keiji YAMADA

SERIAL NO: 10/509,688

EXAMINER: YOUNG, NATASHA E.

FILED: March 14, 2005

FOR: HONEYCOMB FILTER FOR CLARIFYING EXHAUST GAS

**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

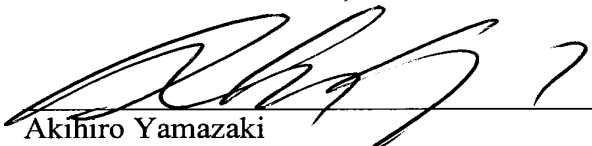
This request is being filed with a Notice of Appeal.

The review is requested for the reason(s) stated on the attached sheet(s). No more than five (5) pages are provided.

I am the attorney or agent of record.

Respectfully Submitted,

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## PRE-APPEAL BRIEF CONFERENCE ARGUMENTS

### **I. Request for Discussion of Amendments that May Result in Allowance**

The remarks below provide explanations and discussions on the distinctions between the claimed invention and the cited references. Applicant respectfully requests the Examiner to contact and discuss with the undersigned, should any amendments to the pending claims are deemed necessary to clarify the distinctions discussed below and place this application in condition for allowance.

### **II. Description of the Invention**

Claims 1-4 and 7-12 are presently pending in this application, Claim 1 being independent and Claims 2-4 and 7-12 being directly or indirectly dependent from Claim 1.

Claim 1 is directed to a honeycomb filter for purifying exhaust gases and recites: “a columnar body comprising a plurality of porous ceramic members, each of said porous ceramic members comprising silicon carbide and having a plurality of through holes extending in parallel with one another in a length direction of said columnar body and a wall portion interposed between said through holes, said wall portion being configured to collect particles in exhaust gases; and a plurality of plugs comprising silicon carbide and filling ones of said through holes at one end of said columnar body and other ones of said through holes at the other end of said columnar body, wherein said columnar body has a porosity which is in a range from 20 to 80%, said plugs have a porosity which is 90% or less, and said porosity of said plugs is set to 0.15 to 4.0 times of said porosity of said columnar body.”

By providing such a columnar body, the honeycomb filter of Claim 1 exhibits improved thermal resistance and mechanical strength, and a thermal stress exerted during its use is dispersed among the porous ceramic members. Furthermore, the porosities of the

columnar body and plugs are set within certain ranges and the difference between the thermal expansion coefficients of the columnar body and the plugs is set smaller, taking advantages attributable to the use of silicon carbide and at the same time making less susceptible to gap formation between the highly porous columnar body and plugs, which may be caused by the large thermal expansion coefficient of silicon carbide. As a result, the columnar body is significantly less susceptible to cracking caused by the thermal expansion and thermal stress due to the repetitions of a high temperature regeneration process during which the particles collected on the wall portion are burned by a heated gas.

### **III. The Claimed Invention Is Not Obvious over the Cited References**

In the outstanding Office Action, Claims 1-4 and 7 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. (U.S. Patent 5,595,581) in view of Ohno et al. (U.S. Patent 6,669,751); Claims 8, 9 and 11 over Ichikawa et al. and Ohno et al. in view of Abe et al. (U.S. Patent 6,869,573); and Claims 10 and 12 over Ichikawa et al. and Ohno et al. in view of Whittenberger (U.S. Patent 5,140,813).

The Office Action states that “[t]he applicant argues that it would not have been obvious to modify the teachings of Ichikawa et al, since Ohno et al teaches increasing pressure loss (see Remarks, page 7)” and that “[t]he examiner disagrees” because “Ichikawa et al discloses not increasing pressure loss (see column 1, line 64 through column 2, line 3)” and because “Ohno et al discloses small pressure loss (see column 2, lines 60-62).”

It is respectfully submitted that these statements are not understood because Applicant’s previous response states that “Ohno et al. merely states ... that the porosity of its filters are set in order to improve the flow of exhaust gas and reduce the pressure loss caused

by its use,<sup>1</sup> thereby undesirably increasing the pressure loss *if the porosity of the second sealing members 22 described in Ichikawa et al. were adopted in the Ohno et al. apparatus*” (emphasis added in italic). In other words, if the Ohno et al. apparatus were modified to adopt the porosity of the second sealing members 22 described in Ichikawa et al., the flow of exhaust gas and the thermal conductance of the seal layer adhering the porous ceramic bodies are compromised, thereby deteriorating the heat conductance between the ceramic bodies (*i.e.*, filters), burning the particles less effectively, and resulting in undesirable increase in the pressure loss.

As stated in the previous response, Ichikawa et al. criticizes that an apparatus which removes the collected particles by burning by means of periodically igniting the filter is ineffective and problematic.<sup>2</sup> Hence, Ichikawa et al. simply proposes that the second sealing members 22 plugging the gas flow passages at the downstream end have porosity which allows the blow-back air to easily pass through without increasing pressure loss (*i.e.*, higher porosity), thereby releasing the deposited particles efficiently.<sup>3</sup> That is, the Ichikawa et al. apparatus regenerates by a blow-back process in which the particles collected in the partition wall are removed by effectively passing a blow-back air through the second sealing members 22 and the gas flow passages in the reverse direction.<sup>4</sup> As such, Ichikawa et al. clearly leads away from the apparatus described in Ohno et al. as Ohno et al. is directed to an apparatus which regenerates by burning the collected particles. Furthermore, Applicant wishes to point out that given the forgoing differences between Ichikawa et al. and Ohno et al., the modification of the Ohno et al. apparatus for the porosity of the second sealing members 22 described in Ichikawa et al. clearly changes the principle of operation, and it is well established that “[i]f the proposed modification or combination of the prior art would change

<sup>1</sup> See Ohno et al., column 2, lines 40-45, column 6, lines 1-4, and column 24, lines 50-54.

<sup>2</sup> See, for example, Ichikawa et al., column 1, lines 23-50.

<sup>3</sup> See Ichikawa et al., column 1, line 64, to column 2, line 3, and column 4, lines 33-54.

<sup>4</sup> See, for example, Ichikawa et al., Figures 1A and 1B.

the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious.”<sup>5</sup>

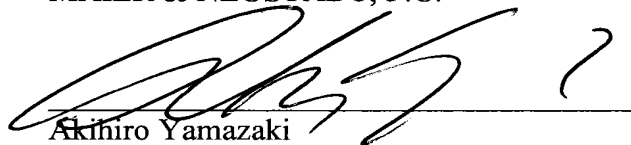
Based on the foregoing discussions, it is respectfully submitted that the structure recited in Claim 1 is distinguishable from Ichikawa et al. and Ohno et al., and Applicant respectfully requests that the outstanding obviousness rejection based on the combination of Ichikawa et al. and Ohno et al. be withdrawn.

For the foregoing reasons, Claim 1 is believed to be allowable. Furthermore, since Claims 2-4 and 7-12 depend directly or indirectly from Claim 1, substantially the same arguments set forth above also apply to these dependent claims. Hence, Claims 2-4 and 7-12 are believed to be allowable as well.

In view of the discussions presented above, Applicant respectfully submits that the present application is in condition for allowance, and an early action favorable to that effect is earnestly solicited.

Respectfully submitted,

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<sup>5</sup> *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

**RELATED CASE STATUS UPDATE**

Instant Application No: 10/509,688

Aug-17-2009

Application No / Control No	PTO Action Description	PTO Mail Date	Applicant Action Description	Date Filed
10/502,045	Final Rejection	Feb-12-2009	Final Resp (2nd)	Jul-08-2009
10/502,045	Final Rejection	Feb-12-2009	RCE	Jul-30-2009
10/510,344	Notice of Allowance	Jun-11-2009		
10/518,548	1st Office Action	Jun-11-2009		
11/092,902	Office Action	Feb-10-2009	OA Response (2nd)	Jul-10-2009
11/127,236	Office Action	Apr-14-2009	OA Response (1st)	Aug-14-2009
10/541,462	Office Action	Apr-23-2009		
11/145,986	Office Action	Feb-11-2009	OA Response (1st)	Jun-11-2009
12/033,417	Office Action	Jun-29-2009		
12/116,503	1st Office Action	Jun-15-2009		
12/137,753	Final Rejection	Jul-27-2009		